

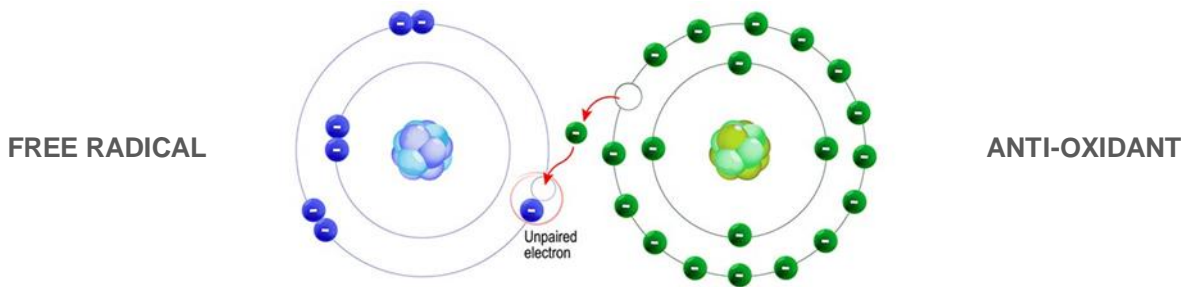


Free Radicals & Anti-Oxidants (Part 2)

Last month, in Part 1 of this 2-part upskill, we looked at free radicals and the oxidation they create within the skin. This month, we will look at the solutions that Nimue provides in the fight against these free radical families.

ANTI-OXIDANTS Nimue's solution to free radical damage

Anti-oxidants are described as a molecule stable enough to donate an electron to a destructive free radical and neutralise it, thereby reducing its capacity to damage. It assists in preventing and repairing damage to body tissues, inhibiting the effects of free radicals.

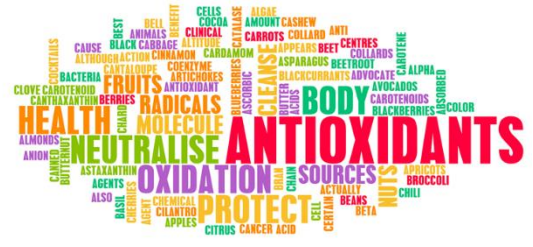


Anti-oxidants are one of the four treatment principles of Nimue, forming part of the Nimue philosophy. Over the years, anti-oxidants have evolved from humble beginnings, where its key functions were to preserve product freshness, protect product integrity and prevent changes due to oxidation, causing unpleasant product aromas.

Today, anti-oxidants have more sophisticated applications. They are complex molecules and are able to perform many important functions in the body.

KEY FUNCTIONS OF ANTI-OXIDANTS

- Repair damaged molecules
- Prevents oxidation
- Shield DNA
- Regulate DNA cell genetics
- Inhibits cell damaging enzymes
- Chelate metal radical production
- Precursors to cell mediators



Anti-Oxidants and Free Radicals: Creating the Balance



When the skin is exposed to oxygen-containing free radicals (caused by the air we breathe, UV radiation, stress, cigarette smoke and pollution), **oxidation** occurs. Oxidation is capable of causing cellular damage and dysfunction.

The body's first line of defence is to suppress the formation of free radicals. Some anti-oxidants naturally present in the body, will remove them. If there is, however, an imbalance between the systemic manifestation of reactive oxygen species and the body's ability to readily detoxify the reactive intermediates or to repair the resulting damage, **ROS**, also known as **Reactive Oxidative Stress**, will occur. Creating a balance is extremely important.

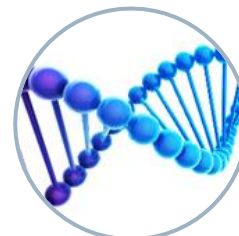
TYPES OF ANTI-OXIDANTS

Some anti-oxidants suppress the formation of free radicals, while others “scavenge” to remove them before they do damage, or work to repair damage once it has been done.

ENDOGENOUS ANTI-OXIDANTS

These are anti-oxidants made by our bodies, participating directly in the neutralisation of free radicals and ROS. They include the following:

- **Enzymatic Endogenous Anti-oxidants**
 - Anti-oxidants that remove free radicals produced during metabolic reactions
- **Non-enzymatic Endogenous Anti-oxidants**
 - Low molecular mass compounds that contributes to cellular balance
 - These include some amino acids and hormones present in the body which has anti-oxidant activity



EXOGENOUS ANTI-OXIDANTS

We get these anti-oxidants from our diet or through oral supplementation. This also includes the topical anti-oxidants that are used in skincare formulations.

The benefits of anti-oxidants in skincare has progressed greatly over the years. These include anti-inflammatory effects, skin firming, reduction in lines and wrinkles and the repair of damage caused by sun exposure.

- **Fat Soluble Exogenous Anti-oxidants**
 - Anti-oxidants that function primarily in the cell membranes e.g. Vitamin E
- **Water Soluble Exogenous Anti-oxidants**
 - These anti-oxidants are able to function both inside the cytoplasm of the cells, protecting cell DNA, and around the cells e.g. Vitamin C



KEY ANTI-OXIDANTS IN NIMUE

- Vitamin C Ester
- Vitamin C L-Ascorbic Acid
- Micro-encapsulated Vitamin C
- Vitamin E Ester
- Micro-encapsulated Vitamin A,C and E
- Anti-oxidant Complex
- Green Tea Extract
- Pichia Resveratrol
- Alpha Lipoic Acid
- Ubiquinone
- Manilkare Multinervus
- GGP
- Diglucosyl Gallic Acid
- Nicotinamide (Vitamin B3)
- Albizia Julibrissan
- Hydrolised Myrtle Leaf Extract



The anti-oxidants used in Nimue offer multiple functions within the skin. These include Vitamin C Ester, which also has the ability to stimulate collagen synthesis, and Hydrolised Myrtle Leaf Extract, which increases cell longevity and also assists against glycation.

PROTECTION AGAINST ROS, RCS AND RNS

Certain of the anti-oxidants used in Nimue not only protect the skin against Reactive Oxygen Species (ROS), but some even focus on the Reactive Carbonyl Species (RCS) and Reactive Nitrogen Species (RNS) forms of free radicals (*discussed in Upskill Part 1*).

Protection against RCS

- **Albizia Julibrissan**
Night Fader, Night Fader Plus, Nimue-TDS™ Environmentally Damaged, AI Face Serum
- **Manilkare Multinervus**
Skin Refirmer
- **Alpha Lipoic Acid**
Alpha Lipoic Activator, Rejuvenating Mask, Smart Resurfacer

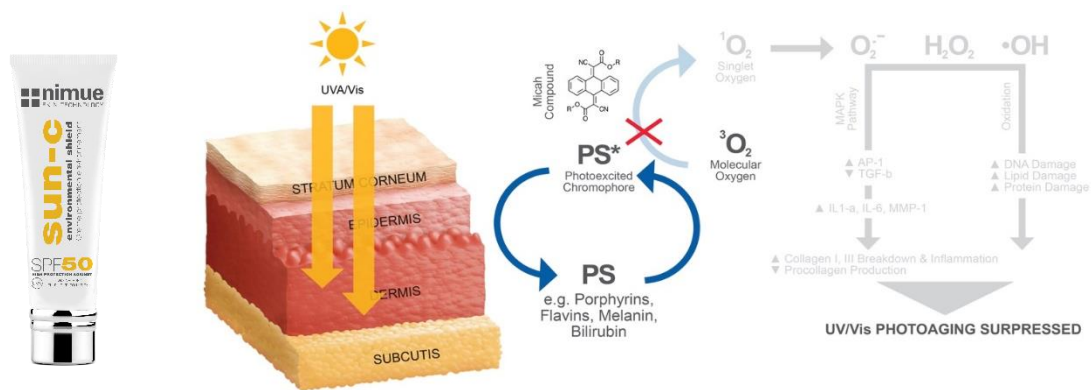
Protection against RNS

- **Dimethylmethoxy Chromonol**
Sun-C SPF 40
Sun-C Environmental Shield SPF 50

NEW TECHNOLOGY OF PREVENTING FREE RADICAL FORMATION

Nimue has even gone one step further with the introduction of CYANOACRYLATE, found in Environmental Shield SPF 50 and Super Fluid CA. This ingredient STOPS the development of light induced free radicals and ROS BEFORE they actually occur in the skin.

This is the new paradigm within anti-ageing chemistry and it is a revolutionary and safe way of blocking the formation of light induced oxidative stress, which causes damage to the membranes and DNA.



Besides the topical use of anti-oxidants in Nimue skincare formulations, we need a CONCERT of anti-oxidants that complement each other's actions and ensure that as many free radicals are neutralised as possible.

Various ways that we can support our skin with more anti-oxidant protection is to follow a healthy diet rich in anti-oxidants, limit exposure to oxidative, carbonyl and nitrogen stress and supplement orally with anti-oxidants.

Anti-oxidants truly are a fundamental part of protecting and repairing the skin and it is an integral part of achieving true skin health.

